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(54) HIGH RUST RESISTANT DRILLING TRAPPING SCREW MADE OF MARTENSITIC STAINLESS STEEL EXCELLENT IN SCREWING PROPERTY AND METHOD FOR QUENCHING THE SAME

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain the subject screw $M-33.8 \quad 1.4Cr_{eq}+Ni_{eq}$ in which the softening of a surface layer caused by heat treatment at the time of quenching is suppressed, in a drilling tapping screw made of a martensitic stainless steel added with alloy elements using SUS410 as the base, by limiting the components to the ranges in which residual does not occur and controlling a heat treating atmosphere.

$$F=Ni_{eq}+1.25Cr_{eq}+1.3$$

SOLUTION: A cold formed drilling tapping screw of a steel having a compsn. contg., by weight, 0.13 to 0.30% C, 0.30% Ni, 11.0 to 15.0% Cr, 0.5 to 3.0% Mo, 0.013% N, 2.0% Mn and 2.0% Cu, contg., at need, 0.001 to 0.010% B, in which the value of M expressed by the formula I is regulated to 0%, the value of Fe expressed by the formula II is regulated to 0% and the value of Al expressed by the formula III is regulated to 16%, and the balance Fe is held in a vacuum or in an inert gas atmosphere heated at 1000 to 1250° C and is thereafter cooled. In such a way, the objecting screw in which the residual austenite content in the surface layer is regulated to <10% can be obtd., where $Ni_{eq}=Ni+0.5Mn+0.44Cu+30C+18N$ and $Cr_{eq}=Cr+1.5Si+1.4Mo$ are satisfied.

$$Al=Cr+2.4Mo$$

LEGAL STATUS

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表 3

		実施条件 (左欄)			試験結果 (右欄)	
No	鋼No	雰囲気	窒素分圧 (atm)	M 2	ねじ込み性 (○: ねじ込み可能) (×: ねじ込み不可)	
本 発 明 例	24	1	真空	0	2.59	○
	25	1	A r	0	2.59	○
	26	1	窒素	0.7	0.01	○
	27	1	窒素	0.3	1.58	○
	28	3	真空	0	0.66	○
	29	3	A r	0	0.66	○
	30	3	窒素	0.02	0.25	○
	31	4	真空	0	3.58	○
	32	4	A r	0	3.58	○
	33	4	窒素	1.0	0.11	○
	34	4	真空→窒素	0→1.0	3.58→0.11	○
比 較 例	35	1	窒素	1.0	-0.89*	×
	36	1	窒素	0.8	-0.31*	×
	37	3	窒素	1.0	-4.44*	×
	38	3	窒素	0.8	-3.86*	×

【0037】

【発明の効果】本発明のねじ込み性に優れた高耐錆性マルテンサイト系ステンレス製ドリリングタッピンねじの焼入方法によれば、焼入時の加熱保定の雰囲気を実空、不活性ガスにするか、窒素分圧を規定よりも下げることにより、窒化による表層の残留 γ の生成を防止でき、ねじ込み性に優れたマルテンサイト系ステンレス製高耐錆*

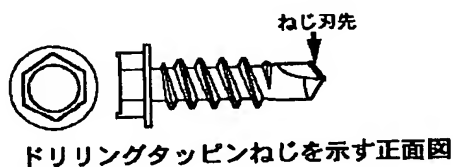
*性ドリリングタッピンねじを安定して得ることができる。

【図面の簡単な説明】

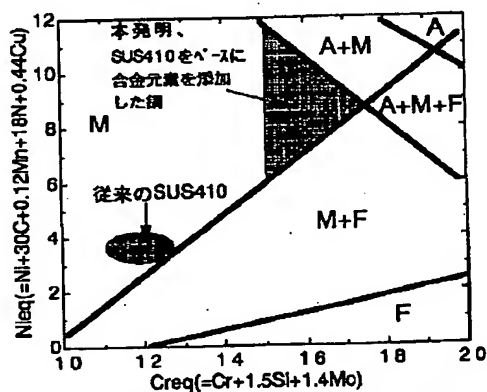
【図1】ドリリングタッピンねじを示す正面図。

【図2】マルテンサイト系ステンレス鋼の1100℃付近からの焼入後の組織図。

【図1】



【図2】



マルテンサイト系ステンレス鋼の約1150℃付近からの焼入れ後の組織図

(図中のMはマルテンサイト組織、Aはオーステナイト組織、Fはフェライト組織を示す。)